Vice or Virtue? The Impact of Earnings Management on Bank Loan Agreements

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ABSTRACT

This study investigates the implications of earnings management (EM) on corporate loan pricing. Through two competing hypotheses (signaling hypothesis and managerial opportunism hypothesis), we find that banks increase loan spread as the level of EM increases. Banks view EM as a value-destroying process that hampers a borrower's capacity to repay a loan and therefore demand a marginal increase in loan spread to compensate for future uncertainty and monitoring cost. The result is robust for a variety of earnings management measures, such as accounting accruals (Jones, 1991), real activities manipulation (Roychowdhury, 2006), and cash flow and earnings volatility (Jayaraman, 2008). While this study also confirms that lender certification and relationship strength have a mitigating effect on information friction between a lender and borrower, lenders still view active earnings management as a risk-increasing activity.

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1. Introduction

The relationship between the cost of capital and information quality of a firm is a critical issue in finance and accounting. In an influential survey study, Graham et al. (2005) documented that firm managers make efforts to smooth earnings to maintain earnings predictability even in the face of longer-term cost. The authors suggested that one such cost is an increase in cost due to raising external financing. Although there exists a strong theoretical argument for the relationship between accounting quality and the cost of capital, academic studies have provided mixed results. McInnis (2010) found no causal link between earnings management practices and the cost of capital, while Bharath et al. (2008) found a strong impact of accounting accruals on the cost of debt.[1] Examining the informational effects of corporate financing, prior studies mainly focused on public financing, while studies on accounting quality and private debt are relatively rare. Moreover, recent studies have shown that earnings management can be multi-faceted and accruals is not the only way to measure the level of a firm's earnings management. In this study, we apply several measures of earnings management to private debt contracting terms from a syndicated loan market and investigate the impact of earnings management on bank loan contracting in a simultaneous framework.

Anecdotal evidence suggests that the manipulation of accounting information will increase the cost of capital because the quality of a financial statement is key for a creditor to evaluate the riskiness of a borrower during debt contracting. If creditors perceive reporting flexibility from financial statements as a manager's egoistic acts, the cost of debt should rise because creditors would demand compensation for uncertain future debt repayment.

Contrary to the negative role of earnings management in general, the opposing view suggests that income smoothing does not necessarily reflect a manager's selfish motives. Rather, it could be the outcome of a manager's strategic plan or confidence in a firm's future operating performance. A majority of CFOs argue that their reporting discretion is a part of their risk management strategy and therefore would reduce cash flow volatility to improve earning predictability (Bodnar et al., 2014), which can even contribute to an increase in firm value (Kirschenheiter and Melumad, 2002). If creditors view earning management as irrelevant with respect to the future capability of a borrower's debt payment, the cost of debt should not be sensitive to reporting discretion. In this view, the concept of an ill-minded manager's "manipulation" is disputable.

[1] See also Francis et al., 2004, 2005; Graham, Li and Qju, 2008; Kim and Sohn, 2013; Costello and Wittenberg-Moerman, 2011; Lambert et al., 2007.

In this study, we add to the existing literature by providing robust empirical results to test conflicting views regarding the impact of earnings management on *private debt* contracting. We focus on private debt contracting for several reasons. First, if managerial discretions truly undermine a firm's value-increasing goal, bankers would be the first external entity who can detect such harmful behavior because of banks' special monitoring role. Banks are superior to the diffusely owned arm's length debt holders in accessing private information because of banks' intimate relationship with borrowing firms (Diamond, 1984, 1991).

Second, recent studies on earnings management and financing contracting used samples of bond or equity issues; however, it is difficult to know whether their results can be generalized in private loan pricing. Although bonds and loans share some commonalities, they have different characteristics. For instance, bank loans are more likely to be secured than bonds, and secured lenders recover more, on average, than unsecured creditors (Cantor and Varma, 2004; Khieu, Mullineaux, and Yi, 2012). Bank loans are also typically senior to bonds in a firm's capital structure.

Moreover, a majority of loan agreements are renegotiated before their maturity (Roberts and Sufi, 2009) due to changes in profiles of the borrower, such as changes to the credit quality of the borrower during the loan duration. Renegotiation usually involves alteration of loan maturity, loan amount, and interest rates on loan and loan covenants. Conversely, public debts are difficult to alter terms of debt agreements before maturity because of the diffused ownership by a large number of creditors; therefore, renegotiations are often not suitable. We argue that loans are more conducive than bonds for testing the information effect on the cost of capital because of their frequent scrutiny by creditors.

In this study, we use a sample of syndicated loans from medium-to-large corporate borrowers (i.e., private debts) to test whether banks price a firm's earnings management. By testing our hypothesis using loan data, we can shed light on how a lender's information access and renegotiation flexibility affect the quality of accounting information in the loan origination process. Practices of earnings management can reflect managers' opportunistic behavior, expanding their egoistic motives (managerial opportunism hypothesis) or their confidence regarding future operating performance (signaling hypothesis).

Our initial results show that as the level of accruals and real earnings management increase, loan spread becomes larger, controlling other loan and firm characteristics. A group of syndicated lenders is keenly aware of the opportunistic behavior of management with respect to loan agreements. Lenders view the quality of accounting statements as one of the key pricing metrics and include them in loan valuation.

We also attempt to identity which loan contracting terms play a role in mitigating information friction between lenders and borrowers. We investigate whether lender reputation and prior lending relationship can alleviate the information problem in the presence of a manager's intention to manage earnings.

The remainder of this paper is organized as follows. In Section 2, we review the related literature and develop hypotheses. Section 3 discusses the empirical design. Section 4 provides the sample selection. The

main results are presented in Section 5. Section 6 summarizes alternative ways to support the main results; Section 7 concludes the manuscript.

2. Literature review and hypotheses development

2.1. Quality of accounting information and its effect on financing decisions

In the Jensen and Meckling (1976) framework, where agency conflicts arise due to information asymmetry within firms, the literature has identified financial transparency as one of the internal mechanisms used to alleviate conflicts. The trouble is that the quality of financial reporting suffers when its preparers exercise the reporting flexibility allowed by the current GAAP, as well as engaging in outright manipulations. Earnings management generally refers to a situation where insiders alter financial reports to "influence contractual outcomes that depend on reported accounting numbers" (Healy and Wahlen, 1999).

A strand of literature categorizes two types of earnings management: accruals-based earnings management (AM hereafter) and real activities earnings management (RM hereafter). Accruals-based earnings management is a practice with no direct cash flow consequences, often called accruals manipulation. Examples include under-provisioning for bad debt expenses by financial institutions and delaying asset write-offs by capital-intensive industry. Real earnings management entails direct cash flow consequences to meeting an earnings target. Roychowdhury (2006) defines (p.337) RM as "departures from normal operational practices, motivated by managers' desire to mislead at least some stakeholders into believing certain financial reporting goals have been met in the normal course of operations." [2] Some examples include reduction in R&Ds in investing activities (Dechow and Sloan, 1991; Bushee, 1998), an increase in price discounts to inflate sales, overproduction to lower the cost of goods sold, reduction in discretionary expenditures to improve margins in operating activities, and stock repurchase to avoid earning dilution arising from an employee stock option.

Graham, Harvey, and Rajgopal (2005) surveyed CFOs and documented that 80% of CFOs would decrease R&D, advertising, and maintenance expenditures to deliver targeted earnings. This is surprising because managers are more willing to engage in RM as opposed to AM.

An important and obvious question is what drives earnings management in general. The literature provides competing arguments to demonstrate the managerial incentives of earnings management. On the one hand, opportunistic managers tend to engage in earnings management because of personal benefits tied to earnings. Bergstresser and Philippon (2006) documented that a significant increase in the use of accruals

[2] Zang (2011) defines real earnings management as "a purposeful action to alter reported earnings in a particular direction, which is achieved by changing the timing or structuring of an operation, investment or financing transaction, and which has sub-optimal business consequences."

was related to the increase in stock-based CEO compensation during the period of 1990-2000.[3] Similarly, Chen and Warfield (2005) found that egoistic managers tend to reserve current earnings to support future earnings deficiency to maximize gain from exercising stock options.

On the other hand, earnings management is often associated with corporate objectives beyond executives' personal gains. For example, the inflation of earnings surrounding corporate events, used to mislead investors, is a common practice for deriving the desired outcome. Using accruals-based earnings management, Teoh et al. (1998b) found that opportunistic managers intentionally inflate earnings to influence SEO pricing (see also Rangan, 1998, Shivakumar, 2000 for SEO pricing; Louis, 2004 for M&As; Chou et al., 2006 for reverse leveraged buyouts; Fields, Gupta, and Wilkins, 2012 for bank loan agreements).[4] A price reversal surrounding event announcements is related to the opportunistic behavior of managers, who attempt to mislead external investors to draw favorable terms.

The results of previous earnings management studies are inconclusive and sensitive to the choice of accrual measurements. We use various ways to measure earnings management: (1) accounting accruals (Jones, 1991)[5]; (2) real earnings management (Roychowdhury, 2006); (3) cash flow volatility, earnings volatility, and the accrual component of earnings volatility (Jayaraman, 2008). The results are not sensitive to the various measures of earnings management, i.e., accruals-based earnings management or real earnings management.

In this study, we focus on the debt financing case and argue that management manipulates accounting information to extract economic rents during the loan contracting process. For example, firms with refinancing needs tend to increase discretionary accruals prior to bank loan agreements to influence credit evaluations by banks (Fields, Gupta, Wilkins, 2012). If the lender views earnings manipulation as opportunistic ex ante (*Managerial Opportunism Hypothesis*), the borrower is penalized with a higher interest rate, reduction in loan limit, and/or shorter maturities on loans in the contracting stage. This potential punitive consequence of earnings management encourages the borrower to exercise accounting conservatism (Zhang, 2008; Watts and Zimmerman, 1986). Zhang (2008) argued that more conservative use of accounting information triggers ex post violation of debt covenants in a timely manner following a negative price shock, and lenders share ex post benefits with the borrower by offering lower interest rates to more conservative borrowers. Timely loss recognition therefore increases debt contracting efficiency (Watts and Zimmerman, 1986; Watts, 2003). Easley and O'Hara (2004) succinctly noted that an important

[3] Bergstresser and Philippon (2006) stated (p.528) that "CEO undertake socially wasteful but personally beneficial projects, was an archetype of the 1970s and 1980s, then a highly incentivized CEO, manipulating reported earnings, have become an archetype of the late 1990s."

[4] There is a mixed result from other studies, however. Ball and Shivakumar (2006) directly distorted the findings of Teoh et al. (1998a) and argued that IPO firms report earnings more conservatively.

[5] Dechow et al. (2012) suggested that if the hypothesized earnings management is correlated with firm growth, use of the Jones or Modified Jones models should alleviate omitted variable bias and also suggest caution regarding the use of performance matching.

role of precise accounting information is to reduce the cost of capital by decreasing the information-based systematic risk to uninformed investors. Simply speaking, more liberal accounting practices will be penalized and more conservative ones can be rewarded. If an argument of practicing accounting conservatism is valid, we expect a positive relationship between earnings management and the cost of a loan because banks downgrade the creditworthiness of a borrowing firm with more active earnings management. The essential part of the argument is that lenders screen out the active earnings management firm because accounting flexibility makes the lender's due diligence difficult to achieve and that liberal accounting practices make the ex post monitoring more challenging. This view is consistent with the *Managerial Opportunism Hypothesis* and predicts that the loan spread is positively associated with earnings management.

The opposing view does not focus on managers' personal egoistic motives but considers the practices of earnings management from the perspective of shareholder wealth maximization. For example, Louis and Robinson (2005) suggested, using a stock split sample, that managers attempt to convey private information through earning accruals to pass a manager's *optimism* onto investors. External investors may perceive earnings smoothing as risk reduction because it improves earnings predictability through lower volatility, therefore supporting the stock price. A lower earnings volatility reduces outside claimants' perceptions regarding a firm's probability of bankruptcy, thereby lowering the cost of capital, leading to increase in the market value of the firm (Trueman and Titman, 1988; Francis, LaFond, Olsson and Schipper, 2005). We call the effect of a manager's optimism on the cost of capital the *Signaling Hypothesis*. The signaling hypothesis dictates that a manager's incentives to manage earnings reflect an *optimistic* view rather than *opportunistic* behavior. Although both hypotheses predict that managers are incentivized to engage in earnings management prior to corporate events such as capital acquisitions, external parties (such as lenders) may not consider a firm's actions to be harmful to their interests if earnings management is not directly related to their future expected income.

Our *Signaling Hypothesis* suggests a non-negative effect of earnings management on the cost of external capital, or even implies a positive effect of earnings management on information transparency. Prior studies found that corporate debt yields are negatively related to real earnings management (Ge and Kim, 2014) or abnormal accruals, suggesting that bondholders do not perceive earnings management as opportunistic but as information transparency or the management's confidence regarding future operating performance (Bouwman, 2014). Banks have access to private information related to the borrowing firms through intimate relationships built through repeated transactions (Petersen and Rajan, 1994); therefore, banks, equipped with private information, can comprehend a firm's efforts to signal the manager's optimistic view regarding future operating performance. Holding other risk variables (such as ratings,

leverage, loan purposes and others) constant, earnings management can be negatively associated with loan spread (signaling hypothesis).

A strand of academic studies on the cost of capital reveals mixed results. Bharath et al. (2008) found the strong impact of the use of accounting accrual on the cost of debt and found that due to the poor accounting quality, borrowers tend to issue loans more often than bonds. Francis et al. (2005) documented that poor accounting quality is associated with a larger cost of debt and equity. Conversely, McInnis (2010) found no relation between earnings smoothness (defined as earnings volatility relative to cash flow volatility) and average stock returns from 1975 to 2006. Because of the mixed results from prior studies, we leave a final conclusion regarding empirical tests using bank loan samples.

2.2. Monitoring, bank certification, and relationship lending in syndicated loan market

In syndicated loan markets, in which multiple banks jointly issue credit, information asymmetry between the lead and participating banks (lead bank moral hazard problem) plays a role in setting the price of loans, as well as information asymmetry between the borrower and lenders (borrower moral hazard problem). The moral hazard issue can be loosely termed as future uncertainties because it is an issue that occurs ex post loan grants. After having closed a contract, if the participants delegate monitoring to a lead arranger, the moral hazard problem arises, i.e., lead banks may shirk from due diligence of optimal monitoring (Holmstrom, 1979; Holmstrom and Tirole, 1997) because monitoring efforts are costly. The lack of monitoring is typically aggravated, as the bank's monitoring efforts are not visible and the lead banks retain a small portion of loans (Sufi, 2007; Ivashina, 2009).[6] Recognizing this potential moral hazard, participating lenders have an incentive to press the lead arrangers to adjust the price of a loan, although participating banks supplement their future monitoring with third party information such as credit ratings.

In this "double moral hazard" environment, previous studies identified two mechanisms that mitigate the information problem: the lead banks' reputation and the relationship strength between the lead banks and borrower. For example, lead banks with dominant market shares can truthfully certify the creditworthiness of a borrower and share information with participating banks (Bushman and Wittenberg-Moerman, 2012; Champagne and Kryzanowski, 2007). The reputable lead lender(s) certifies the borrower's creditworthiness and mitigates information asymmetry in increasing the probability of future debt repayment; this assurance can draw concession from participating banks to set a lower rate on syndicated credits. We call this the *Lender Certification Hypothesis.*

The bank-borrower relationship also consolidates a bank's perception regarding the creditworthiness of the borrower; as a result, a lower interest is applied during contracting (Brick and Palia, 2007; Bharath

[6] Conversely, a larger portion of the loan retained by the lead banks not only signals a credible commitment to due diligence and ex post monitoring efforts but also signals the borrower quality ex ante.

et al., 2011; Berger and Udell, 1990). We call this the *Relationship Strength Hypothesis*. If lender certification and relationship strength are valid factors in mitigating information friction, we conjecture that these two variables should play an important role in setting the loan spread, even in the presence of active earnings management.

3. Empirical design

In this section, we specify the bank loan pricing model using pricing factors, including two components of earnings management. The dependent variable is loan spread, or the cost of the bank loan, measured as the amount that the borrower pays in basis points over a benchmark rate for each loan dollar drawn down. The loan spread is the initial all-in-drawn rate minus the London Interbank Offered Rate (LIBOR), as reported in the LPC's *DealScan* database and enters the regression in log form. It includes the spread of the loan and any annual or facility fees paid to the bank group. Because the cost of bank loans is affected by both firm- and loan-specific factors, we include these control variables when estimating the empirical model, in addition to our main test variables related to a firm's earnings management. In Appendix A, we describe the modified Jones (1991) model to measure accrual earnings and the Roychowdhury (2006) model to measure the degree of real earnings management. Descriptions and measurements of key variables are summarized in Appendix B. Putting together all these variables, we examine the association between a firm's earnings management practice and loan spreads in the following general form of the regression model:

Loan spread = f (Earnings management variables, loan characteristics, firm characteristics, and year-fixed and industry-fixed variables)

We estimate OLS regressions and calculate White's (1980) heteroskedasticity robust *t*-statistics after clustering at the facility level for repeated firms in our sample over the sample period. All OLS regressions include industry and year dummies to control for industry- and year-fixed effects.

4. Data and sample selection

Syndicated loans are medium- or large-sized loans extended to firms by a group of lenders.[7] In a typical syndicated loan contract, a small number of lenders, called lead lenders or arrangers, ask other participating banks to issue a relatively large-sized loan package for the purpose of risk sharing and meeting capital requirements. The loan contracting process is very similar to that of the equity IPO process. Lead banks

[7] According to the Depository Trust and Clearing Corporation (DTCC), global syndicated loan markets totaled more than $4.5 trillion in 2007, an increase of 13% over 2006. The largest syndicated loan market is the U.S. market, which grew to $2.1 trillion in 2007, an increase of more than 20% over 2006.

commit to composing loan syndicates using their private network and assume a risky position by retaining a portion of the loan and allocating the remaining loan shares to participating banks. The role of lead lenders is to bridge the gap between borrowers and participating banks and serve both sides of the table; for the borrower, the lead bank secures financing, while for the participating banks, it exercises credit-screening of borrowers with due diligence and offers ex-post monitoring of the borrowers. As such, the syndicated loan market is a good laboratory for testing our hypotheses, which address the informational friction between a borrower and lender.

We collect a bank loans sample from the Thomson Reuters LPC *DealScan* database over the period of 1987-2012. The *DealScan* database cumulates loan data, mostly syndicated loan data, from various sources, including SEC filings and public financial documents, such as 10Ks and 10Qs, since 1981. In some cases, LPC directly searches for the data with borrowers, lenders, and other sources. The coverage of U.S firms in *DealScan* increased in 1987, and its coverage has improved to cover approximately 65% of the number of Compustat firms in recent years. We screen *DealScan* for loan facilities originating in the U.S. and match loan samples with firm-level financial information from *Compustat* using the DealScan-Compustat matching table provided by Chava and Roberts (2008). The basic unit of our sample is an individual loan, also referred to as a facility or tranche in *DealScan*, although loans are packaged into deals. The sample initially contains information regarding 73,331 loan facilities from 10,043 firms. We exclude financial (SIC codes from 6000 to 6999) and regulatory (SIC codes from 4900 to 4949) firms. After deleting observations with missing data in Compustat, we obtain a final sample of 25,172 loans (19,697 deals) from 5,175 firms from 1987 to 2012.[8]

5. Empirical results

5.1. Descriptive statistics

Table 1 presents distributions of sample bank loans based on different sets of characteristics: loan type and credit ratings. A typical syndicated loan usually originates from multiple loans or tranches, where a "deal" or "loan package" is structured to include both a line(s) of credit (or revolvers) and term loan(s). A revolver is a credit-line from which the borrowing firm can draw funds within a pre-specified limit at the borrower's discretion until a loan reaches maturity, while a term loan is a simple interest plus principal loan. Revolvers are essentially lines of credit that can be drawn on-demand. Revolvers are typically priced higher than term loans for the *same* borrower because of their flexibility for the borrower and the uncertainty of cash requirements for the lender. However, an average loan spread of term loans across borrowers is higher

[8] We estimate some regressions with fewer than 25,172 facility-year observations depending on the availability of earnings attribute data.

than that of revolvers, reflecting that term loans are lower with respect to payment priority in liquidation upon default. Multiple tranches in a syndicated loan package are related to a borrower's tradeoff between short-term and long-term financing, as well as to the riskiness of the borrowing firm.

We report summary statistics in Table 1. The average loan spread was approximately 205 basis points above the LIBOR. The average facility or loan size was approximately $308 million. Approximately 54% of the loans were issued for the purpose of maintaining general corporate operations, with an additional 17% of loans being issued for working capital management. On average, the book value of the sample borrowing firms was approximately $6.5 billion, with a leverage level of 33%; however, just over half of all loans (54%) were secured with some form of collateral. Approximately 58% of loans were revolvers, while 29% were term loans, and the average maturity was approximately 45 months.

[Insert Table 1]

Table 2 shows the results of correlation analyses. Descriptions of measuring accrual earnings and real earnings management are in given Appendix B. Generally, loan spreads are positively associated with earnings management variables under the univariate setting. A further analysis using a multivariate setting is required to see if bankers price practices of earnings management. Signs of correlation coefficients for other control variables are also generally consistent with the findings of previous studies.[9] For example, loan spread is higher for those firms with lower credit rating, higher leverage, smaller asset base, lower market-to-book ratio, and worse profits. Loan spread is also higher for those loans with smaller loan amount, smaller lending syndicate, loans with pledged collateral, installment payments (i.e., term loans as opposed to revolvers), and first-time loans without a previous relationship.

[Insert Table 2]

5.2. The effect of earnings management on the price terms of bank credits

In this empirical section, we present multivariate analyses to investigate whether earnings management activities are priced in loan origination. First, as detailed in the hypotheses development section, we test two competing hypotheses (Signaling Hypothesis and Managerial Opportunism Hypothesis). Later, in the robustness test section, we provide additional evidence of loan pricing by introducing alternative measures of earnings management and address the endogeneity issue.

[9] The correlation coefficients among variables are relatively low and there are less multicollinearity problems in our regression model.

Using both accruals and real earnings management measures in several model specifications, Table 3 presents our baseline regression results regarding the effect of earnings management on the cost of bank loans. Two types of earnings management measures, as detailed in Appendix A, are included in the regression analyses: accrual earnings management (AM) and real earnings management (RM). If banks have the ability to detect practices of earnings management based on the borrowing firm's surrounding loan agreement, they should raise the loan spread and the coefficients of earnings management variables (*AM, RM1, and RM2*) should be significantly positive. [10]

In Table 3, Column 1 and Column 2 analyze the costs of a bank loan with real earnings manipulations, as defined by Cohen and Zaowin (2012), where *RM1* is defined as the sum of *Abnormal PROD* and *Abnormal DISEXP* and *RM2* is defined as the sum of *Abnormal CFO* and *Abnormal DISEXP*, along with loan and firm characteristics and other control variables. Column 3 shows bank loan pricing with accruals earnings management (AM). Columns 4 through 6 show the result of regression, repeated using the firm fixed effects model. In these results, the estimated coefficients are significant at the 1% level, indicating that lenders price the borrowing firm's earnings manipulations, whether earnings management is measured at a specific accounting dimension (*AM*) or at an aggregate level of cash flow manipulations (*RM1* and *RM2*). The results show that lenders view practices of earnings management as harmful to loan repayment. Banks also have a good understanding regarding the divergent consequences of choices between AM and RM and recognize both types of earnings management.

[Insert Table 3]

In general, the result shows that firms with more active earnings management activities are associated with higher loan spreads. The positive signs on coefficients of earnings management variables suggest that banks penalize those borrowers with severe earnings manipulations and recognize the benefits of precise accounting practices, controlling for firm and loan characteristics. We align this result with Jensen and Meckling's (1976) framework, in which creditors demand higher returns as compensation for potential loss due to a manager's incentives to engage in actions that benefit the shareholder at the creditor's expense. Likewise, Francis *et al*. (2005) showed a similar relation between cost of equity and earning quality. This result supports the managerial opportunism hypothesis, i.e., that lenders dislike earning massages, whether they are done via accruals or real earnings manipulation. This is consistent with the view that lenders value accounting conservatism when evaluating creditworthiness. It is also aligned with the notion from the

[10] Banks are not the only external group who willingly recognize the extent of earnings management. For example, Gunny (2010) reported that analysts' forecasted earnings appear to reflect the extent of real earnings manipulations.

banking literature that banks are considered as "information specialists" due to their ability to extract private information through the lending process and their efficient ex post monitoring role in mitigating information asymmetries (Diamond, 1984). Earnings predictability enhanced by income smoothing, which is often argued by managers to have a positive effect on overall firm success, does not appear to be of major interest to creditors.

5.3. The interaction effect of lender reputation and lending relationship on loan spread

Thus, the question arises: what mitigating factors potentially contribute to reducing the concerns of lenders, i.e., moral hazards undermining future debt repayment from the borrowing firm with the existence of earning manipulation? The literature indicates several mechanisms, including lender certification, collaterals, and the borrower-lender relationship strength, that help mitigate information friction. For example, lead banks with a dominant market share can truthfully certify the creditworthiness of a borrower and share information with participating banks (Bushman and Wittenberg-Moerman, 2012; Champagne and Kryzanowski, 2007; Ross, 2010). Diamond (1991) developed a formal model that stresses the role of banks in producing quality information regarding a firm and in developing a reputation in the form of a history of successful debt repayments. If lead banks accumulate reputation through successful completion of prior loan syndications, even in the case of the exacerbating of earnings management practices by the borrowing firm, participating banks may agree to relaxing the terms of loan contracting. In this scenario, the effect of earnings management on loan spread will be lessened due to the lender reputation effect.

Similarly, a prior relationship with the borrowing firms is also an important pricing metric. The bank-borrower relationship consolidates a bank's perception regarding the creditworthiness of the borrower; as a result, a lower interest is applied during loan contracting (Brick and Palia, 2007; Bharath et al., 2011; Berger and Udell, 1995). In a syndicated loan market, the lead bank(s) has access to the borrower's private information as a part of due diligence to serve participating banks; as a result, the bank builds repeated lending relationships.

Does the effect on loan spread of increasing earnings management depend on whether a loan is syndicated by reputable lead banks and relationship banks? One way to answer this question is to use a specification that allows for two different regression lines, depending on whether lead arrangers are reputable banks and lead arrangers are relationship lenders. Following Ross (2010), we define reputable banks as top 5 banks who hold most of the loan volume for a given year. For the lending relationship, we include an indicator variable that is equal to one if a loan is from the same lead lender as one who arranged loans for the last three years.

Table 4 presents the interaction effects of lead lender reputation and relationship strength on loan spread. This lender certification argument suggests a negative sign on the *Reputation* variable, as shown

consistently in Table 4, Columns (1) through (3). Similar to Bushman and Wittenberg-Moerman (2012), [11] we capture the top five banks as reputable banks. The result from Columns (1) and (3) suggests that the top five banks have a certification or reputation effect in that they can provide a lower spread, holding everything else constant, including earnings management, through a better ex ante credit screen and/or ex post monitoring role. With a more rigorous pre-screening and by evaluating the creditworthiness of the borrowers, the reputable banks can achieve a high reputation via a track record of successfully re-paid loans in their transaction history (Ross, 2010; Bushman and Wittenberg-Moerman, 2012). [12] Similarly, Ball, Bushman, and Vasvari (2008) highlighted the debt-contracting value as the ability of accounting reporting to capture deterioration in credit quality in a timely manner. Because lead lenders with high reputation retain a high level of debt contracting value, participating banks can be persuaded to agree on a lower spread.

[Insert Table 4]

When we include an interaction term between earnings management and the reputation variable, as shown in Columns (1) and (2), all interaction terms and the *Reputation* dummy are statistically significant and positive. This suggests that the effect of earnings management on loan spread varies based on the reputation of the lead banks. With a reputation dummy variable only, the regression results show that on average, loans originating from reputable banks are associated with lower rates, holding the earnings management factor constant, while a positive interaction term suggests that the borrowers tend to pay a higher rate on loans syndicated by top 5 banks. For each unit increase in earnings management, reputable banks penalize the borrowing firms more, i.e., the coefficient on *Abnormal RM*Reputation* for the regression line (Reputation = 1) is positive. Reputable banks have a large market share and retain more sophisticated screening technology to detect the earnings management of the borrowing firms. We interpret that they can effectively detect a firm's opportunistic behaviors through sophisticated screening technology; they increase loan rates proportionately to protect their reputation in the syndicated loan market.

In Table 4, Columns (4), (5) and (6), we report similar results of relationship strength. As discussed earlier, information asymmetry between lenders and borrowers is a critical component of loan pricing. Lenders must invest significant resources and pay due diligence to assess the creditworthiness of potential borrowers and to screen poor quality borrowers with unfavorable repayment potential. Even after a loan is

[11] The authors classify J.P. Morgan Chase, J.P. Morgan (before M&A), Bank of America, Citigroup, Wachovia (before M&A), Credit Suisse First Boston, Bank One (before M&A), Fleet Boston (before M&A), and Deutsche Bank as reputable arrangers. Together, these banks syndicated over 65% of the loan volume. The remaining syndicated loans were arranged by more than 1,000 banks, the vast majority of which had a market share of less than 0.02%. The dominant effect of top five seems evident in many aspects.

[12] One counter-argument is that these top lenders are not only compensated by interest rates but also by higher fees attached to each loan package.

granted, lenders must monitor the borrower to check its moral hazard behavior. However, this information friction can be mitigated if the lending banks have a strong, durable relationship with the borrower. This past information enables the lending banks to produce the borrower-specific information efficiently; therefore, a lower rate can be granted (Boot and Thakor, 2000). Following this banking theory, we include a dummy variable capturing a prior relationship with the borrower that includes any loans granted to the same borrower from the same lead banks over the last three years. Column (6) from Table 4 suggests that relationship banking is valuable to the borrower due to the reduction in interest. Coefficients of the *Previous Lending* variable are statistically significant at the 1% level and are negative. However, an interaction term between relationship and earnings management from Columns (4) and (5) suggests that relationship lenders have more private or soft information regarding the borrowers and find earnings management to be opportunistic, therefore penalizing their relationship borrowers. Lead lenders have a due diligence obligation to serve their participating banks by providing extra return on the opportunistic behaviors of the borrowers and also to protect their own interests to secure future participation from other lenders for future deals.

6. Robustness tests

6.1. Alternative measures for earnings management

Our baseline regression results suggest that lenders price the practice of a borrower's earnings management in private debt contracting. To test whether the results presented above are an outcome of chance, we introduce an alternative way to measure the practice of a borrower's earnings management as a test of robustness. Recent literature used the deviation of earnings from cash flows to gauge the level of a manager's desire to smooth incomes (Leuz, Nanda, and Wysocki, 2003; Kirschenheiter and Melumad, 2002). While managers are often incentivized to smooth earnings and thus the volatility is lower than cash flow volatility, it is also common that managers' accounting conservatism allows earnings to be more volatile than cash flows, e.g., a practice of timely gain and loss recognition (Ball and Schivakumar, 2006). Whether volatilities of both cash flow and earnings are proxy measures of a manager's discretion over financial reporting, these volatilities are critically associated with the level of a firm's critical investments and therefore hamper earnings power. A volatile cash flow often defers capital expenditures, makes the capital budgeting process difficult, delays debt service, and hinders other productive operations. As a result, the negative nature of volatilities is embedded in firm valuation negatively and the cost of obtaining external capital rises (Minton, Schrand, Walther, 2002).

Using the methodology of Jayaraman (2008), we measure the accrual component of earnings volatility (*ACEV*) as the difference between earnings volatility (*Earnings Vol*) and cash flow volatility (*Cash Flow Vol*), where earnings volatility is defined as the standard deviation of three years' earnings before

extraordinary items, scaled by assets, while cash flow volatility, as the standard deviation of three years' annual cash flow from operations, scaled by assets. Our conjecture is that earnings that are either smoother or more volatile than cash flows are associated with a manager's proactive discretionary choices, which may prompt lenders to price it during bank loan contracting.

[Insert Figures 1 2, and 3]

Figures 1 through 3 show a graphical presentation of the measures used in cash flow and earnings volatilities, as defined by Jayaraman (2008). The graphs show a linear relationship between the loan spread reported in *DealScan* and volatilities of both earnings and cash flows. Figures 1 and 2 also confirm linearity between volatilities and loan spreads. However, the accrual component of earnings volatility (*ACEV*) appears to be significantly associated with higher loan spread on both ends of the loan spread spectrum. The results from Figure 3 indicate a U-shaped relation between earnings that are smoother or more volatile than cash flows and loan spread. Earnings that are smoother than cash flows appear to be associated with larger loan spreads. Loan spread is lowest at the center of the distribution, where *ACEV* is close to zero (i.e., where earnings volatility is equal to cash flow volatility). As earnings become more volatile than cash flows, loan spread increases. Thus, earnings that are more volatile than cash flows also appear to be associated with larger loan spreads.

Table 5 presents regression results regarding the relationship between various earnings attributes and corporate loan spread. Results show that firms with a higher level of cash flow volatility and earnings volatility, a higher level of negative cash flows, and a higher volatility of the accrual component are associated with higher loan spreads. They are all consistently significant at the 1% level, suggesting that lenders perceive volatility and other measures of the earnings attribute as risky factors and demand a higher credit spread ex ante. Consistent with the survey results of Graham, Campbell, and Rajgopal (2005), many CFOs fear that earnings volatility, holding cash flow volatility constant, depresses the P/E ratio; therefore, maintaining the stock prices at a desired level is a manager's top priority. Similarly, Minton et al. (2002) found that firms with high volatility should have lower future earnings, while Dichev and Tang (2009) argued that earnings volatility hampers earnings predictability.

[Insert Table 5]

6.2. Collateral as a mechanism to test whether the lender prices earnings management

In this section, we continue providing additional evidence of earnings management as a risky factor priced in loan contracting. Among those loan pricing factors identified as theoretically and empirically critical factors, we pay closer attention to loan collateral.

Collateral has been a central issue in debt contracting studies. The first set of studies found collateral as a way for good borrowers to signal their quality under conditions of ex ante private information. The lowest risk borrowers will pledge collateral when borrowers have informational advantages regarding their default probabilities. Because collateral could also impose opportunity costs on borrowers by tying up assets that might otherwise be utilized in more productive ways, this signaling story predicts that safer borrowers are more likely to pledge collateral (Besanko and Thakor, 1987; Chan and Kanatas, 1985). Furthermore, the opportunity costs of providing collateral force borrowers to reveal the true value of their assets, giving borrowers an incentive to offer collateral in exchange for a lower loan rate.

However, these theoretical findings are not generally consistent with empirical studies revealing that riskier loans tend to be collateralized. The alternative set of studies explains collateral as an optimal response to ex post contract frictions such as moral hazard, i.e., collateral as a mechanism to overcome borrower/lender incentive conflicts. For example, Berger and Udell (1990) found a positive relationship between loan rates and the existence of collateral in credit contracts, consistent with the moral hazard issue (see also Berger and Udell, 1995; Jimenex, Salas, and Saurina, 2006; Battacharya and Thakor, 1993; Ahn and Choi, 2009). Using accounting data, Kim, Song, and Zhang (2011) found that the likelihood of a loan being secured by collateral is higher for borrowers with a high level of internal control issues than for borrowers with a low level of issues.

We test whether the lenders require collateral during loan contracting for an ex post moral hazard. A lender is more likely to demand collateral if the lender perceives the practice of earnings management as potentially correlated with the ex post moral hazard. We specify the likelihood of pledging loan collateral in a logistic regression, where cash flow and earnings volatility are test variables.

Table 6 presents the results of logistic regression, which are used to investigate the relation between the accrual component of earnings volatility and the use of collateral by banks. Collateral is determined at the deal level, not at the facility level. Thus, we exclude loan types and loan purposes in the regression. Results show that borrowers with more volatile earnings, negative cash flows, and a higher amount of the accruals component of earnings volatility are more likely to supply collateral during loan contracting.

[Insert Table 6]

6.3. The effect of earnings management on the non-price term of loan pricing

Although loan spread is a major component of loan pricing, there are other non-pricing factors to consider. For example, Berg, Steffen, and Saunders (2016) found that more than 80% of syndicated loans in the U.S. market have at least one type of fee. Syndicated loans have several terms contingent upon loan origination, such as loan cancellation and drawdown options. Thus, examining the entire structure of loan pricing, including loan spread (i.e., pricing term) and fees (i.e., non-pricing term), provides a complete analysis of the effect of earnings management on loan contracting. Following the total-cost-of-borrowing (TCB) approach by Berg, Steffen, and Saunders (2016), located on Berg's web site (http://www.tobias-berg.com/index.php/research/), we construct the TCB measure for our earnings management sample. Table 7 shows the OLS results after regressing the TCB measures of earnings management variables on loan contracting terms. All coefficients of AM, RM1, and RM2 are significantly positive at the 1% level. The TCB measure, a comprehensive measure of the non-pricing term, is positively related to the practices of earnings management. The results of Table 7 provide additional robustness with respect to the fact that banks recognize earnings management as an additional risk factor in debt contracting and therefore demand a marginal compensation for risk-increasing practices by the borrowing firms.

[Insert Table 7]

6.4. Endogeneity and simultaneity issues

If both earnings management measures and loan spreads are determined jointly by some unobservable omitted variables, the OLS regression estimates may be unreliable. It is possible that unobservable omitted variables that are correlated with both firm-level risk and EM engagement may drive the regression results. For example, board quality or corporate governance of the borrowing firm may influence both its earnings management and loan spread; a borrower with a higher quality board is more likely to engage in moderate EM activities, while lenders may incorporate a borrower's board quality when they set its loan price. Moreover, another concern is the possible simultaneity or feedback effect between loan spread and EM engagement. A high EM engagement may yield a higher spread, but it is also conceivable that a low risk firm with a better loan rate, which happens to have a stable earnings stream, may induce less EM engagements. Simultaneity yields biased and inconsistent estimates when the OLS model is applied.

Several studies of bank loans address various endogeneity issues, including shareholder rights affecting the cost of a loan (Chava et al., 2008), board characteristics affecting loan covenants (Chakravarty and Rutherford, 2011), and board quality affecting the cost of a loan (Francis et al., 2012). Considering the potential for bias due to the endogeneity problem, recognized in existing bank loan studies, we conduct several robustness tests to ensure the validity of our empirical results. Regression analysis with instrumental variables is a commonly used way to obtain a consistent estimator of the unknown coefficients of the

population functions when the regressor is correlated with the error term. In this approach, two key criteria that an instrumental variable must satisfy are relevance and validity. Relevance suggests that the instrument is correlated with the endogenous variable, whereas validity suggests that the instrument affects the dependent variable only through the endogenous variable. Hence, an effective instrumental variable in our paper must be related to the suspected endogenous EM variable but unrelated to the dependent variable of loan spread directly. Unfortunately, it is difficult to find true, valid instrumental variables within the current setting of our paper, requiring future study of an efficient econometric approach.

Although we cannot perfectly solve the endogeneity problem of the loan pricing model, we run simultaneous equation model and fixed effect model to deal with the endogeneity issue. In summary, if loan spread and earnings management are jointly determined, then ordinary least squares estimation can lead to bias. To address this concern, we estimate a simultaneous equation model of loan spread and earnings management as jointly endogenous. In addition to the fixed effect models in Table 4, Table 8 shows the results of the simultaneous equation model. To obtain a complete list of controls, we add several variables, as shown in the variable description of Table 8. With or without these additional controls, the earnings management variable, as the independent variable, is statistically significant, whereas loan spread, as the dependent variable, is insignificant. This suggests that the relation is not bidirectional.

We conduct the Hausman specification test (Hausman, 1978), which rejects the null hypothesis at the 1% level, for both model specifications in Columns (4) and (6). The results show that earnings management raises the loan spread on average after considering the endogenous nature of the loan spread-earnings management feedback effect; the coefficients in Column (1), Column (3), and Column (6) are statistically significant. Additional controls are generally significant and have consistent signs with those found in prior studies.

[Insert Table 8]

7. Conclusions

This study investigates the implications of earnings management (EM) on corporate loan pricing. Practices of earnings management can reflect managers' opportunistic behavior to expand their egoistic motives (managerial opportunism hypothesis) or signal their optimism (or confidence) regarding future operating performance (signaling hypothesis). To investigate the viability of these two competing arguments, we draw a sample of syndicated loans from medium-to-large corporate borrowers (i.e., private debts) to test whether banks price a firm's earnings management. Between two competing hypotheses, we find that banks are able to price the earnings management of the borrowing firm and increase loan spread as the level of EM increases (managerial opportunism hypothesis). The result is robust, using a variety of

earnings management measurements such as (1) accounting accruals (Jones, 1991); (2) real earnings management (Roychowdhury, 2006); (3) cash flow volatility, earnings volatility, and the accrual component of earnings volatility (Jayaraman, 2008).

The study also enhances the argument that banks are superior in digesting private information gained through intimate interactions with the borrowing firm. Lender certification and relationship strength have a material effect on mitigating information friction not only between a lender and borrower but also between lead lenders and participating banks. The reputable and relationship lender certifies a borrower's creditworthiness and mitigates information asymmetry in increasing the probability of future debt repayment; this assurance can draw concession from participating banks to a lower rate with respect to syndicated credits. However, interaction analysis using the lead lender-borrower matching scheme shows that these same lead lenders demand proportionately higher loan rates for firms with active earnings manipulations than non-reputable lenders do. Similarly, if the lending banks have built a durable but reusable relationship through prior engagement with the borrower, relationship lenders can produce borrower-specific information more efficiently; therefore, a lower rate can be granted while holding other factors constant, including earnings management. However, in the case of earnings manipulation, lenders can detect such active earnings management efficiently through intimate past relationships and penalize the borrowers more than non-relationship lenders to protect their future interests and secure loan syndicate integrity.

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Table 1
Descriptive statistics

Variable	Mean	Median	P25	P75
Loan Spread (bps)	205.1	187.5	87.5	275
Maturity (months)	44.7	48	24	60
Loan Size (million $)	308.1	100	25	300
Reputation	0.351	0	0	1
Previous Lending	0.204	0	0	0
Performance Pricing	0.391	0	0	1
Total Lender	7.301	4	1	10
Collateral	0.535	1	0	1
Term Loan	0.291	0	0	1
Revolvers	0.579	1	0	1
365 Facility	0.081	0	0	0
CF Volatility	0.051	0.036	0.020	0.064
Earnings Volatility	0.059	0.027	0.012	0.063
Negative CF	0.139	0	0	0.333
Accruals Volatility	0.008	-0.005	-0.025	0.018
RM1	0.028	0.054	-0.154	0.258
RM2	0.021	0.035	-0.098	0.165
AM	0.093	0.052	0.022	0.107
Firm Size	6.537	6.537	5.141	7.905
ROA	0.020	0.041	-0.006	0.083
Leverage	0.334	0.309	0.186	0.446
Market-to-book	2.500	1.867	1.072	3.138
Coverage	6.927	2.170	-0.123	6.681
Z-score	2.872	2.545	1.571	3.798
Firm Age	20.92	15	9	31

This table presents summary statistics of loan and firm-specific characteristics. The variable definitions are provided in Appendix B.

Table 2
Correlation matrix

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Loan Spread	(1)	1														
CF Volatility	(2)	0.226***	1													
Earnings Volatility	(3)	0.276***	0.441***	1												
Negative CF	(4)	0.296***	0.440***	0.352***	1											
Accruals Volatility	(5)	0.185***	-0.084***	0.847***	0.150***	1										
RM1	(6)	0.047***	-0.077***	-0.075***	0.027***	-0.043***	1									
RM2	(7)	0.087***	-0.050***	-0.031***	0.117***	-0.006	0.881***	1								
AM	(8)	0.153***	0.265***	0.315***	0.232***	0.196***	-0.029***	-0.046***	1							
Firm Size	(9)	-0.509***	-0.382***	-0.291***	-0.390***	-0.102***	0.073***	0.017***	-0.186***	1						
ROA	(10)	-0.285***	-0.177***	-0.254***	-0.319***	-0.194***	-0.052***	-0.100***	-0.118***	0.216***	1					
Leverage	(11)	0.245***	-0.052***	0.040***	0.043***	0.085***	0.064***	0.082***	-0.0104	-0.009	-0.218***	1				
Market-to-Book	(12)	-0.146***	0.0018	0.003	-0.031***	-0.006	-0.110***	-0.118***	0.004	0.070***	0.119***	-0.096***	1			
Coverage	(13)	-0.171***	-0.033***	-0.098***	-0.160***	-0.095***	-0.085***	-0.116***	-0.033***	0.044***	0.446***	-0.278***	0.101***	1		
Z-score	(14)	-0.283***	-0.010	-0.179***	-0.157***	-0.202***	-0.159***	-0.195***	-0.031***	-0.007	0.534***	-0.490***	0.252***	0.524***	1	
Firm Age	(15)	-0.319***	-0.182***	-0.149***	-0.181***	-0.058***	0.040***	0.029***	-0.141***	0.424***	0.099***	-0.077***	0.027***	0.014**	0.020***	1

This table shows the correlation matrix of the variables between dependent variables and firm-specific variables. The variable definitions are provided in Appendix B. Significance at the 10%, 5%, and 1% levels is indicated by *, **, and ***, respectively.

Table 3
The effect of earnings management on loan spread

	Dependent var. = Loan Spread					
	OLS			Fixed-effects Model		
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
RM1	0.035***			0.060***	.	.
	(4.03)			(3.59)		
RM2		0.057***			0.091***	
		(4.63)			(4.68)	
AM			0.152***			0.082***
			(5.92)			(2.70)
Maturity	-0.002***	-0.002***	-0.002***	-0.002***	-0.002***	-0.002***
	(-7.83)	(-8.12)	(-8.68)	(-9.86)	(-10.00)	(-11.23)
Loan Size	-0.071***	-0.071***	-0.069***	-0.063***	-0.063***	-0.065***
	(-15.15)	(-15.41)	(-15.91)	(-15.42)	(-15.66)	(-16.80)
Previous Lending	-0.034***	-0.030***	-0.032***	-0.029***	-0.025***	-0.023***
	(-4.04)	(-3.64)	(-4.11)	(-3.20)	(-2.85)	(-2.74)
Performance Pricing	-0.135***	-0.135***	-0.122***	-0.093***	-0.094***	-0.084***
	(-17.72)	(-17.93)	(-17.23)	(-11.30)	(-11.55)	(-10.91)
No. of Lender	0.000	0.000	0.000	-0.001	-0.001	-0.001
	(0.31)	(0.77)	(1.04)	(-1.50)	(-1.54)	(-1.48)
Collateral Dummy	0.382***	0.384***	0.390***	0.259***	0.261***	0.271***
	(43.25)	(43.48)	(45.83)	(28.00)	(28.80)	(31.40)
Syndication Dummy	-0.084***	-0.083***	-0.078***	-0.065***	-0.059***	-0.060***
	(-6.17)	(-6.31)	(-6.09)	(-4.50)	(-4.26)	(-4.48)
Term Loan	0.016	0.029	0.033*	-0.019	-0.006	0.005
	(0.72)	(1.38)	(1.67)	(-1.20)	(-0.39)	(0.37)
Revolver Loan	-0.230***	-0.215***	-0.221***	-0.213***	-0.199***	-0.199***
	(-11.43)	(-10.99)	(-11.93)	(-13.93)	(-13.49)	(-14.34)
364 Facilities	-0.559***	-0.544***	-0.526***	-0.454***	-0.441***	-0.426***
	(-24.33)	(-24.14)	(-25.56)	(-23.15)	(-22.96)	(-24.33)
Firm Size	-0.053***	-0.054***	-0.058***	-0.111***	-0.110***	-0.098***
	(-10.81)	(-11.27)	(-13.11)	(-13.15)	(-13.36)	(-12.41)
ROA	-0.270***	-0.263***	-0.236***	-0.067	-0.060	-0.087**
	(-8.24)	(-8.01)	(-7.29)	(-1.55)	(-1.44)	(-2.14)
Leverage	0.274***	0.279***	0.288***	0.315***	0.304***	0.311***
	(13.82)	(14.14)	(14.94)	(10.01)	(9.96)	(10.57)
Coverage	-0.000**	-0.000	-0.000*	-0.001***	-0.001***	-0.001***
	(-1.98)	(-1.44)	(-1.65)	(-2.88)	(-2.98)	(-3.60)
Z-Score	-0.033***	-0.031***	-0.032***	-0.029***	-0.029***	-0.028***
	(-15.12)	(-14.63)	(-15.80)	(-9.46)	(-9.64)	(-9.57)
Firm Age	-0.001***	-0.001***	-0.001***	-544.408	-84.868	-65.691
	(-3.85)	(-4.22)	(-3.38)	(-0.00)	(-0.00)	(-0.00)
Market-to-Book	-0.001	-0.000	-0.001	-0.002*	-0.001	-0.001
	(-0.77)	(-0.25)	(-0.60)	(-1.73)	(-1.06)	(-1.02)
AAA	-1.060***	-1.067***	-1.094***	-0.274**	-0.284***	-0.267**
	(-11.39)	(-11.52)	(-13.54)	(-2.56)	(-2.65)	(-2.53)
AA	-1.128***	-1.131***	-1.080***	-0.661***	-0.664***	-0.619***
	(-33.42)	(-33.67)	(-32.87)	(-12.57)	(-12.69)	(-13.09)
A	-0.828***	-0.822***	-0.785***	-0.605***	-0.604***	-0.594***
	(-38.03)	(-37.80)	(-40.95)	(-20.65)	(-20.94)	(-24.10)
BBB	-0.266***	-0.266***	-0.237***	-0.227***	-0.225***	-0.216***
	(-17.01)	(-17.13)	(-16.50)	(-10.71)	(-10.81)	(-11.42)
BB	0.123***	0.125***	0.138***	0.122***	0.121***	0.103***
	(11.10)	(11.48)	(13.09)	(7.54)	(7.65)	(6.85)
B	0.249***	0.250***	0.271***	0.194***	0.190***	0.191***

	(21.09)	(21.60)	(24.40)	(11.08)	(11.14)	(11.74)
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes
Ind. dummy	Yes	Yes	Yes	Yes	Yes	Yes
Observations	21,141	21,958	25,034	20,235	21,033	24,015
R-squared	0.688	0.681	0.680	0.810	0.807	0.804

The table presents the regression results of the effect of earnings management on the cost of a bank loan. (1), (2), and (3) are estimated by OLS, clustered by facility level; (4), (5), and (6) are firm- and year-fixed effects models. The dependent variable is *Loan Spread*. The variable definitions are provided in Appendix B. The standard errors are adjusted for facility clustered and adjusted t-statistics are in parenthesis. Significance at the 10%, 5%, and 1% levels is indicated by *, **, and ***, respectively.

Table 4

Interaction effects of lender reputation and relationship strength on loan spread

	Dependent var. = Loan Spread					
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
RM1	0.016			0.024**		
	(1.55)			(2.54)		
RM2		0.032**			0.045***	
		(2.18)			(3.29)	
AM			0.127***			0.151***
			(4.21)			(5.48)
Reputation	-0.054***	-0.052***	-0.057***			
	(-6.94)	(-6.80)	(-6.86)			
Reputation *RM1	0.060***					
	(3.26)					
Reputation*RM2		0.081***				
		(3.07)				
Reputation*AM			0.098*			
			(1.82)			
Previous Lending				-0.036***	-0.032***	-0.032***
				(-4.31)	(-3.80)	(-3.51)
Previous Lending *RM1				0.062***		
				(2.74)		
Previous Lending *RM2					0.075**	
					(2.29)	
Previous Lending *AM						0.006
						(0.09)
Maturity	-0.002***	-0.002***	-0.002***	-0.002***	-0.002***	-0.002***
	(-7.77)	(-8.05)	(-8.60)	(-7.83)	(-8.11)	(-8.68)
Loan Size	-0.070***	-0.070***	-0.068***	-0.071***	-0.071***	-0.069***
	(-14.94)	(-15.22)	(-15.69)	(-15.15)	(-15.43)	(-15.92)
Performance Pricing	-0.136***	-0.136***	-0.123***	-0.135***	-0.134***	-0.122***
	(-17.84)	(-18.09)	(-17.46)	(-17.66)	(-17.89)	(-17.23)
No. of Lender	0.000	0.001	0.001	0.000	0.000	0.000
	(0.62)	(1.14)	(1.41)	(0.27)	(0.77)	(1.04)
Collateral Dummy	0.379***	0.381***	0.388***	0.382***	0.384***	0.390***
	(42.86)	(43.06)	(45.47)	(43.19)	(43.44)	(45.82)
Syndication Dummy	-0.079***	-0.079***	-0.074***	-0.084***	-0.082***	-0.078***
	(-5.83)	(-5.99)	(-5.76)	(-6.15)	(-6.27)	(-6.09)
Term Loan	0.015	0.028	0.033	0.015	0.029	0.033*
	(0.67)	(1.34)	(1.63)	(0.69)	(1.35)	(1.67)
Revolver Loan	-0.230***	-0.215***	-0.221***	-0.230***	-0.215***	-0.221***
	(-11.44)	(-11.00)	(-11.92)	(-11.44)	(-11.00)	(-11.93)
364 Facilities	-0.559***	-0.543***	-0.524***	-0.560***	-0.545***	-0.526***
	(-24.36)	(-24.16)	(-25.51)	(-24.34)	(-24.16)	(-25.56)
Firm Size	-0.053***	-0.054***	-0.058***	-0.053***	-0.054***	-0.058***
	(-10.76)	(-11.18)	(-13.03)	(-10.83)	(-11.29)	(-13.12)
ROA	-0.267***	-0.260***	-0.235***	-0.271***	-0.264***	-0.236***
	(-8.16)	(-7.94)	(-7.27)	(-8.26)	(-8.04)	(-7.29)
Leverage	0.275***	0.280***	0.286***	0.276***	0.280***	0.288***
	(13.85)	(14.19)	(14.89)	(13.89)	(14.20)	(14.94)
Coverage	-0.000**	-0.000	-0.000	-0.000**	-0.000	-0.000*
	(-2.01)	(-1.47)	(-1.64)	(-2.03)	(-1.47)	(-1.65)
Z-Score	-0.033***	-0.030***	-0.032***	-0.033***	-0.030***	-0.032***

	(-15.07)	(-14.59)	(-15.88)	(-15.07)	(-14.59)	(-15.80)
Firm Age	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***
	(-3.87)	(-4.28)	(-3.45)	(-3.77)	(-4.18)	(-3.37)
Market-to-Book	-0.001	-0.000	-0.000	-0.001	-0.000	-0.001
	(-0.66)	(-0.14)	(-0.49)	(-0.68)	(-0.17)	(-0.60)
AAA	-1.047***	-1.055***	-1.097***	-1.052***	-1.060***	-1.094***
	(-11.31)	(-11.46)	(-13.62)	(-11.33)	(-11.45)	(-13.54)
AA	-1.128***	-1.130***	-1.079***	-1.123***	-1.127***	-1.080***
	(-33.43)	(-33.66)	(-32.83)	(-33.19)	(-33.48)	(-32.87)
A	-0.828***	-0.822***	-0.783***	-0.828***	-0.821***	-0.785***
	(-38.09)	(-37.84)	(-40.88)	(-38.02)	(-37.72)	(-40.94)
BBB	-0.268***	-0.267***	-0.237***	-0.266***	-0.265***	-0.237***
	(-17.12)	(-17.24)	(-16.51)	(-17.02)	(-17.12)	(-16.49)
BB	0.124***	0.126***	0.139***	0.123***	0.126***	0.138***
	(11.21)	(11.57)	(13.18)	(11.12)	(11.52)	(13.09)
B	0.250***	0.251***	0.272***	0.249***	0.250***	0.271***
	(21.25)	(21.73)	(24.48)	(21.10)	(21.62)	(24.40)
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes
Ind. dummy	Yes	Yes	Yes	Yes	Yes	Yes
Constant	7.376***	7.352***	7.347***	7.386***	7.361***	7.353***
	(105.01)	(105.88)	(111.69)	(104.87)	(105.77)	(111.73)
Observations	21,141	21,958	25,034	21,141	21,958	25,034
R-squared	0.688	0.681	0.681	0.688	0.681	0.680

We define reputable banks as top 5 banks who hold most of the loan volume for a given year. For lending relationships, we include an indicator variable that is equal to one if a loan is from the same lender as one who arranged loans for the last three years. We include all control variables, which are not shown for brevity. The variable definitions are provided in Appendix B. The standard errors are adjusted for facility clustered and adjusted t-statistics are in parenthesis. Significance at the 10%, 5%, and 1% levels is indicated by *, **, and ***, respectively.

Table 5
Earnings attributes and loan spread

VARIABLES	Dependent var. = Loan Spread (1)	(2)	(3)	(4)
CF Vol.	0.443***			
	(6.21)			
Earnings Vol.		0.456***		
		(12.37)		
Negative CF			0.197***	
			(13.50)	
Accrual Vol.				0.332***
				(7.85)
Maturity	-0.003***	-0.003***	-0.002***	-0.003***
	(-9.62)	(-10.94)	(-7.79)	(-9.82)
Loan Size	-0.077***	-0.065***	-0.076***	-0.076***
	(-17.61)	(-15.15)	(-16.64)	(-17.49)
Previous Lending	-0.030***	-0.005	-0.029***	-0.029***
	(-3.78)	(-0.58)	(-3.60)	(-3.67)
Performance Pricing	-0.116***	-0.105***	-0.120***	-0.116***
	(-16.45)	(-14.67)	(-16.56)	(-16.50)
No. of Lender	-0.001**	-0.002***	-0.001	-0.001*
	(-2.07)	(-3.83)	(-1.06)	(-1.81)
Collateral Dummy	0.396***	0.411***	0.388***	0.395***
	(47.70)	(49.90)	(44.73)	(47.58)
Syndication Dummy	-0.031**	0.028**	-0.024*	-0.031**
	(-2.44)	(2.32)	(-1.78)	(-2.49)
Term Loan	0.044*	0.081***	0.051*	0.042*
	(1.76)	(3.50)	(1.88)	(1.69)
Revolver Loan	-0.164***	-0.118***	-0.163***	-0.165***
	(-6.98)	(-5.44)	(-6.37)	(-7.02)
364 Facilities	-0.479***	-0.436***	-0.475***	-0.480***
	(-19.04)	(-18.26)	(-17.97)	(-19.07)
Corporate Control	0.172***	0.207***	0.181***	0.177***
	(12.44)	(14.13)	(12.75)	(12.76)
Corporate Purpose	0.030**	0.068***	0.031**	0.032**
	(2.44)	(5.18)	(2.51)	(2.57)
Debt Repay	0.032**	0.054***	0.032**	0.034**
	(2.31)	(3.74)	(2.27)	(2.44)
Project Finance	0.033	0.081	-0.005	0.042
	(0.51)	(1.29)	(-0.07)	(0.66)
Firm Size	-0.062***	-0.070***	-0.062***	-0.065***
	(-13.33)	(-15.40)	(-12.92)	(-14.16)
ROA	-0.226***	-0.250***	-0.173***	-0.228***
	(-7.27)	(-8.14)	(-5.20)	(-7.38)
Leverage	0.287***	0.272***	0.266***	0.281***
	(15.20)	(14.79)	(13.60)	(14.93)
Market-to-Book	-0.002***	-0.002**	-0.003***	-0.003***
	(-2.72)	(-2.28)	(-3.66)	(-2.90)
Coverage	-0.000**	-0.000	-0.000***	-0.000***
	(-2.48)	(-0.51)	(-2.92)	(-2.62)
Z-Score	-0.031***	-0.030***	-0.031***	-0.029***
	(-15.53)	(-14.82)	(-14.69)	(-14.56)
Firm Age	-0.000	-0.000	-0.000	-0.000

	(-0.18)	(-0.52)	(-0.58)	(-0.31)
AAA	-1.252***	-1.258***	-1.230***	-1.257***
	(-36.30)	(-31.69)	(-34.55)	(-36.85)
AA	-1.047***	-1.015***	-1.029***	-1.050***
	(-31.39)	(-30.53)	(-30.53)	(-31.50)
A	-0.742***	-0.703***	-0.724***	-0.743***
	(-37.58)	(-34.75)	(-36.19)	(-37.62)
BBB	-0.235***	-0.182***	-0.226***	-0.234***
	(-16.31)	(-12.32)	(-15.51)	(-16.24)
BB	0.170***	0.204***	0.173***	0.171***
	(16.34)	(19.48)	(16.06)	(16.46)
B	0.295***	0.315***	0.302***	0.290***
	(26.02)	(27.75)	(25.74)	(25.55)
Year Dummy	Yes	Yes	Yes	Yes
Industry Dummy	Yes	Yes	Yes	Yes
Constant	7.388***	6.749***	7.412***	7.415***
	(109.31)	(104.61)	(105.84)	(110.24)
Observations	25,867	27,708	23,631	25,867
R-squared	0.677	0.646	0.692	0.677

This table reports OLS regression results regarding the relationship between various earnings attributes and corporate loan spread. The dependent variable is a natural logarithm of loan spreads. All other variable definitions are given in Appendix B. Robust standard errors are adjusted for heteroskedasticity and clustered by firm. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Table 6
Earning attributes and collateral

VARIABLES	Dependent var. = Collateral dummy (1)	(2)	(3)	(4)
CF Vol.	2.696***			
	(6.94)			
Earnings Vol.		2.797***		
		(10.93)		
Negative CF			0.621***	
			(14.63)	
Accrual Vol.				2.042***
				(8.46)
Average Maturity	-0.003***	-0.003***	-0.002**	-0.003***
	(-3.34)	(-3.71)	(-2.14)	(-3.71)
Deal Amount	-0.116***	-0.061***	-0.111***	-0.112***
	(-4.77)	(-2.73)	(-4.26)	(-4.59)
Previous Lending	-0.168***	-0.148***	-0.157***	-0.163***
	(-3.96)	(-3.50)	(-3.54)	(-3.82)
Performance Pricing	0.988***	0.998***	1.022***	0.982***
	(25.00)	(25.90)	(24.58)	(24.85)
Number of Lender	0.025***	0.021***	0.026***	0.026***
	(7.76)	(6.87)	(7.68)	(7.97)
Syndication Dummy	0.301***	0.362***	0.272***	0.301***
	(5.69)	(7.42)	(4.72)	(5.68)
Firm Size	-0.500***	-0.495***	-0.499***	-0.520***
	(-22.46)	(-23.96)	(-21.11)	(-23.37)
ROA	-0.943***	-0.871***	-0.839***	-0.952***
	(-5.26)	(-4.99)	(-4.36)	(-5.35)
Leverage	0.548***	0.482***	0.488***	0.519***
	(5.04)	(4.63)	(4.23)	(4.75)
Market-to-Book	-0.005	-0.006	-0.003	-0.005
	(-0.95)	(-1.22)	(-0.63)	(-1.02)
Coverage	-0.003***	-0.003***	-0.003***	-0.003***
	(-4.57)	(-4.28)	(-4.07)	(-4.76)
Z-Score	-0.082***	-0.069***	-0.078***	-0.071***
	(-8.01)	(-6.89)	(-7.07)	(-7.02)
Firm Age	-0.005***	-0.004***	-0.004**	-0.005***
	(-3.60)	(-3.24)	(-2.52)	(-3.84)
AAA	-1.665	-1.068	-1.629	-1.670
	(-1.64)	(-1.48)	(-1.60)	(-1.64)
AA	-1.060***	-1.229***	-0.958***	-1.083***
	(-3.29)	(-3.83)	(-2.96)	(-3.36)
A	-1.589***	-1.589***	-1.564***	-1.599***
	(-11.88)	(-12.34)	(-11.32)	(-11.96)
BBB	-1.386***	-1.386***	-1.376***	-1.379***
	(-17.03)	(-17.38)	(-16.22)	(-16.94)
BB	0.633***	0.622***	0.672***	0.640***
	(12.00)	(12.20)	(12.14)	(12.09)
B	1.042***	1.005***	1.089***	1.018***
	(16.21)	(16.17)	(15.88)	(15.75)
Year Dummy	Yes	Yes	Yes	Yes
Industry Dummy	Yes	Yes	Yes	Yes
Constant	5.116***	3.506***	4.946***	5.275***
	(14.01)	(11.03)	(12.60)	(14.46)

Observations	22,492	24,050	20,517	22,492

This table reports results for logistic regressions to investigate the relationship between earnings attributes and the use of collateral by banks. The dependent variable is an indicator variable that is equal to one if a loan is collateralized according to LPC DealScan; zero otherwise. All other variable definitions are given in Appendix B. Robust standard errors are adjusted for heteroskedasticity and clustered by firm. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Table 7
The effect of earnings management on non-price term

	Dependent var. = TCB		
VARIABLES	(1)	(2)	(3)
RM1	0.027***	.	.
	(3.24)		
RM2		0.060***	
		(4.74)	
AM			0.139***
			(5.36)
Maturity	-0.004***	-0.004***	-0.004***
	(-20.81)	(-20.81)	(-20.64)
Loan Size	-0.035***	-0.035***	-0.035***
	(-7.98)	(-8.01)	(-8.08)
Previous Lending	-0.030***	-0.030***	-0.030***
	(-4.11)	(-4.14)	(-4.02)
Performance Pricing	-0.163***	-0.163***	-0.162***
	(-23.04)	(-22.99)	(-22.94)
No. of Lender	-0.002***	-0.002***	-0.002***
	(-3.60)	(-3.61)	(-3.71)
Collateral Dummy	0.412***	0.411***	0.411***
	(51.39)	(51.37)	(51.30)
Syndication Dummy	0.041***	0.041***	0.042***
	(2.93)	(2.96)	(2.99)
Term Loan	0.080***	0.080***	0.081***
	(3.31)	(3.31)	(3.35)
Revolver Loan	-0.840***	-0.841***	-0.839***
	(-34.12)	(-34.15)	(-33.94)
364 Facilities	-0.982***	-0.982***	-0.979***
	(-35.39)	(-35.41)	(-35.19)
Firm Size	-0.031***	-0.030***	-0.028***
	(-6.91)	(-6.88)	(-6.44)
ROA	-0.125***	-0.123***	-0.118***
	(-3.37)	(-3.32)	(-3.16)
Leverage	0.319***	0.320***	0.317***
	(17.67)	(17.75)	(17.64)
Coverage	-0.001***	-0.001***	-0.001***
	(-7.01)	(-6.99)	(-6.96)
Z-Score	-0.039***	-0.039***	-0.040***
	(-16.28)	(-16.06)	(-16.74)
Firm Age	-0.001***	-0.001***	-0.001***
	(-3.79)	(-3.88)	(-3.57)
Market-to-Book	-0.000	-0.000	-0.000
	(-0.35)	(-0.23)	(-0.57)
AAA	-0.638***	-0.635***	-0.649***
	(-7.37)	(-7.30)	(-7.56)
AA	-0.879***	-0.877***	-0.885***
	(-27.93)	(-27.90)	(-28.18)
A	-0.758***	-0.757***	-0.760***
	(-42.71)	(-42.68)	(-42.95)
BBB	-0.363***	-0.362***	-0.364***
	(-28.10)	(-28.05)	(-28.18)
BB	0.035***	0.035***	0.035***
	(3.65)	(3.72)	(3.71)
B	0.160***	0.159***	0.159***
	(15.30)	(15.25)	(15.22)

Year dummy	Yes	Yes	Yes
Ind. dummy	Yes	Yes	Yes
Constant	6.325***	6.324***	6.310***
	(89.23)	(89.24)	(88.93)
Observations	17,699	17,699	17,699
R-squared	0.802	0.802	0.802

This table reports results for OLS regressions to show the relationship between the non-price term and earnings management. Following the methodology of Berg, Steffen, and Saunders (2016), we construct the total-cost-of-borrowing (TCB) measure as follows:

TCB = Upfront Fee / Expected Loan Maturity in Years
+ (1-PDD) x (Facility Fee + Commitment Fee)
+ PDD x (Facility Fee + Spread)
+ PDD x Prob(Utilization>UtilizationThreshhold | Usage > 0) x Utilization Fee
+ Prob(Cancellation) x Cancellation Fee

More details can be found at the authors' web site (http://www.tobias-berg.com/index.php/research/). All other variable definitions are given in Appendix B. Robust standard errors are adjusted for heteroskedasticity and clustered by firm. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Table 8
Simultaneous equations model

Dependent var.	Loan Spread	RM1	Loan Spread	RM2	Loan Spread	AM
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
RM1/RM2/AM	-0.433***	.	-0.306***	.	-0.254***	
	(-3.39)		(-3.46)		(-2.79)	
Loan Spread	.	0.089	.	0.057	.	-0.090
		(0.58)		(0.38)		(-0.59)
Maturity	-0.002***	-0.001	-0.003***	-0.001*	-0.003***	-0.003***
	(-5.66)	(-0.92)	(-7.07)	(-1.79)	(-7.20)	(-3.03)
Loan Size	-0.081***	-0.017	-0.078***	-0.020	-0.054***	0.032
	(-8.79)	(-0.83)	(-10.66)	(-1.05)	(-7.42)	(1.56)
Previous Lending	-0.011	0.052*	-0.019	0.045	-0.034***	-0.034
	(-0.64)	(1.67)	(-1.40)	(1.52)	(-2.75)	(-1.04)
Performance Pricing	-0.120***	0.005	-0.127***	-0.022	-0.105***	-0.035
	(-7.35)	(0.13)	(-9.52)	(-0.62)	(-8.51)	(-0.93)
No. of Lender	-0.001	0.000	-0.001	0.000	-0.001	0.001
	(-1.26)	(0.03)	(-1.42)	(0.29)	(-1.35)	(0.61)
Collateral Dummy	0.333***	0.073	0.305***	0.032	0.324***	0.104
	(14.71)	(1.16)	(19.33)	(0.53)	(20.35)	(1.58)
Syndication Dummy	-0.008	-0.060	-0.015	-0.105	0.056*	0.110
	(-0.20)	(-0.78)	(-0.44)	(-1.41)	(1.70)	(1.33)
Term Loan	-0.017	-0.052	-0.003	-0.021	-0.028	-0.076
	(-0.42)	(-0.69)	(-0.09)	(-0.29)	(-0.90)	(-0.96)
Revolver Loan	-0.260***	-0.019	-0.247***	0.004	-0.300***	-0.154*
	(-6.58)	(-0.24)	(-7.87)	(0.05)	(-9.61)	(-1.79)
364 Facilities	-0.578***	0.017	-0.578***	-0.002	-0.597***	-0.180
	(-12.68)	(0.14)	(-15.83)	(-0.02)	(-17.27)	(-1.46)
Firm Size	0.021*	0.042**	0.011	0.026	-0.018**	-0.053***
	(1.93)	(2.43)	(1.38)	(1.54)	(-2.22)	(-2.95)
ROA	-0.087	0.525***	-0.240***	0.227	-0.381***	-0.253
	(-0.82)	(3.27)	(-3.44)	(1.46)	(-5.72)	(-1.42)
Leverage	0.079*	-0.189**	0.144***	-0.028	0.112***	-0.153*
	(1.69)	(-2.22)	(4.19)	(-0.34)	(3.17)	(-1.66)
Coverage	-0.001**	-0.002**	-0.001*	-0.001*	0.000	0.001
	(-1.98)	(-2.17)	(-1.75)	(-1.82)	(0.15)	(1.01)
Firm Age	-0.056***	-0.026**	-0.050***	-0.018	-0.053***	-0.041***
	(-8.03)	(-2.01)	(-9.96)	(-1.44)	(-9.40)	(-2.93)
Market-to-Book	0.000	0.003**	0.000	0.003***	-0.001***	-0.002**
	(0.33)	(2.52)	(0.25)	(3.36)	(-2.66)	(-2.25)
AAA	-0.009***	-0.009**	-0.007***	-0.007**	-0.006***	-0.005
	(-4.04)	(-2.56)	(-4.39)	(-2.14)	(-3.83)	(-1.25)
AA	-1.655***	-0.180	-1.571***	-0.100	-1.268***	0.649*
	(-12.41)	(-0.53)	(-15.35)	(-0.31)	(-11.41)	(1.93)
A	-1.354***	0.010	-1.312***	0.066	-1.300***	-0.156
	(-18.59)	(0.04)	(-22.90)	(0.27)	(-24.52)	(-0.62)
BBB	-0.974***	-0.037	-0.943***	-0.009	-0.831***	0.090
	(-23.47)	(-0.22)	(-29.90)	(-0.05)	(-26.28)	(0.55)
BB	-0.350***	-0.034	-0.337***	-0.019	-0.310***	-0.014
	(-11.33)	(-0.43)	(-13.89)	(-0.25)	(-14.09)	(-0.17)
B	0.018	-0.041	0.024	-0.031	0.020	-0.047
	(0.73)	(-0.91)	(1.24)	(-0.71)	(1.06)	(-0.98)
b	0.078**	-0.190***	0.111***	-0.147***	0.150***	-0.036
	(2.25)	(-3.34)	(4.52)	(-2.69)	(7.20)	(-0.59)
Avg. Spread	0.001***		0.001***		0.001***	
	(12.46)		(15.29)		(16.64)	

SOX Dummy		-0.084		0.076		0.010
		(-0.91)		(0.86)		(0.10)
Big4		-0.036		-0.027		-0.033
		(-1.40)		(-0.89)		(-1.02)
Tax Rate		0.037**		0.047***		0.074***
		(2.38)		(2.77)		(3.56)
Operating Cycle		-0.001***		-0.001***		-0.001***
		(-4.25)		(-4.13)		(-2.84)
Market Share		-0.099**		-0.128***		-0.178***
		(-2.19)		(-2.66)		(-3.24)
NOA Dummy		0.079***		0.113***		0.055**
		(3.44)		(4.31)		(2.42)
Z-Score	0.001***		0.001***		0.001***	
	(12.46)		(15.29)		(16.64)	
Constant	6.876***	-0.377	6.919***	-0.184	6.806***	0.901
	(45.76)	(-0.34)	(56.79)	(-0.17)	(59.46)	(0.83)
Hausman Test						
Chi^2		*-1.24*		*4.03*		*12.24*
Observations	11,318	11,318	11,322	11,322	13,057	13,057
R-squared	0.247	0.073	0.515	0.061	0.520	0.151

Table 8 estimates the simultaneous equation model, where the endogenous variables are earnings management and loan spread. All control variables are specified in Appendix B. *Avg. Spread* is the average loan spread for the past three years. The following measures are based on Zang (2012): *Market Share* is the ratio of a company's sales to the total sales of its industry and captures the inverse of the costs associated with real activities manipulation; *Big4* is equal to 1 if a firm's auditor is one of the Big 4 and zero otherwise; *Tax Rate* is the higher tax rate that induces more earnings management; *SOX Dummy* is equal to one if a loan is issued after 2002 and zero otherwise; *NOA Dummy* is equal to one if net operating assets (i.e., shareholders' equity less cash and marketable securities plus total debt) at the beginning of a year divided by lagged sales are above the industry-year and zero otherwise (measure of previous accounting choices, Barton and Simko, 2002); *Operating cycle* is equal to one if the days receivable plus the days inventory is less than the days payable at the beginning of the year (longer operating cycles have greater flexibility for accrual management) and zero otherwise. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Figure 1

Spread and cash flow volatility

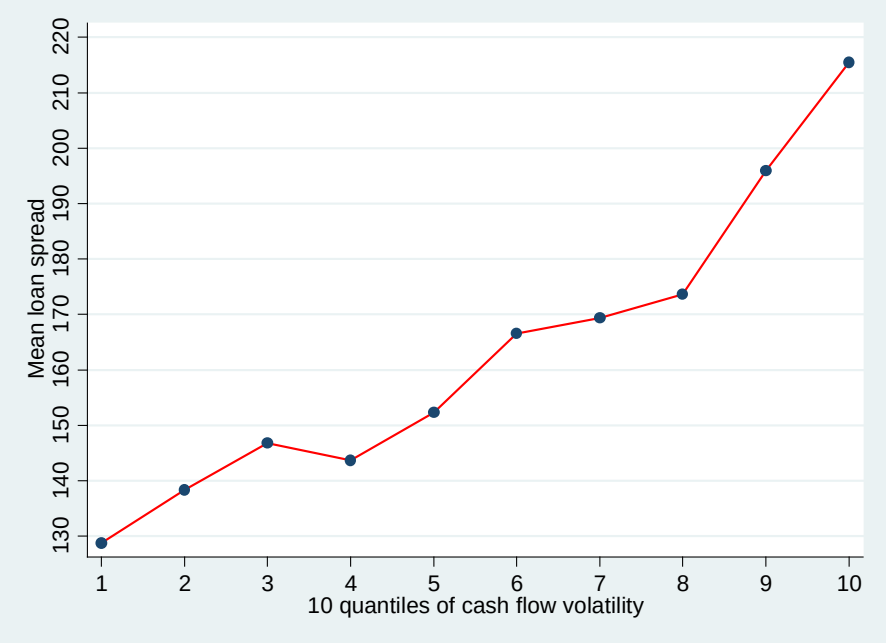


Figure 2

Spread and earnings volatility

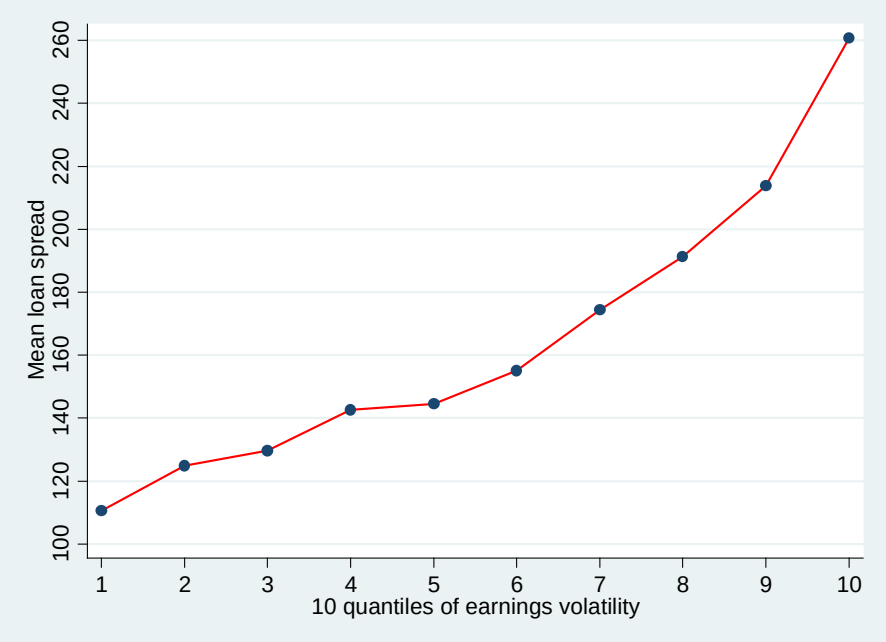
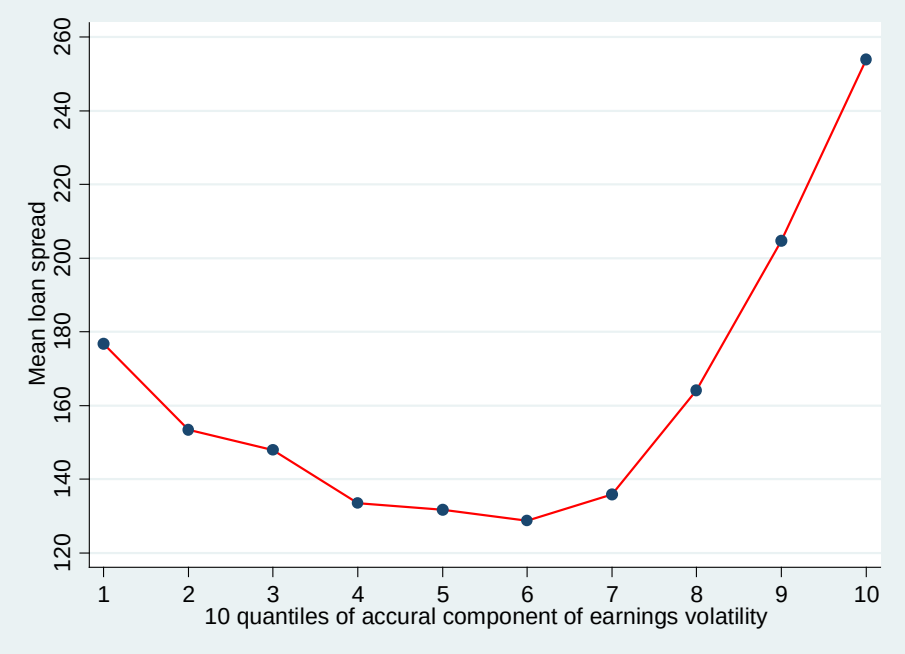


Figure 3

Spread and accrual component of earnings volatility



Appendix A: Earnings management measures

(1) Accrual-based earning management

To measure the degree of accruals-based earnings management, we employ abnormal discretionary accruals as a proxy used in a number of previous studies, notably Davidson et al. (2004), Xie et al. (2003), and Teoh et al. (1998 a, b). Because earnings management is an important issue for academics and practitioners to study managerial behavior, we estimate the discretionary current accruals, which are considered as being "unexpected" or "abnormal," using the modified Jones (1991) model. A larger value of Abnormal AM means more earnings management and lower financial reporting quality. The model has been found to have "the most power in detecting earnings management" (Dechow et al., 1995). Guay et al. (1996) and Bartov et al. (2001) also provided evidence regarding the reliability of the modified Jones model to identify earnings management.

The flexibility of earnings management through accounting items can be used to artificially inflate reported earnings. Thus, we focus on a firm's current working capital accruals or discretionary current accruals that are considered abnormal compared to those of industry peers. These abnormal discretionary current accruals are utilized as a proxy for earnings management. Because the modified Jones (1991) model has been used in many studies and is presented in Teoh et al. (1998 a, b), for the sake of conciseness, we will simply summarize it here.

To capture the earnings management and managerial behavior, we use discretionary current accruals. Total current accruals are the sum of both discretionary and non-discretionary accruals. Because the total current accruals are associated with changing the industry and economic conditions, we identify the non-discretionary component of accruals using the OLS regression-based estimates of the current accruals for the change in sales from the previous year for all non-sample firms in the same 2-digit SIC code, industry *j*, listed in Compustat for the year. Because the error terms of this regression exhibit heteroskedasticity, we deflate each variable in the model by the book value of total assets from the previous year:

$$\frac{TA_{j,t}}{Asset_{j,t-1}} = k_{0,t}\frac{1}{Assets_{j,t-1}} + k_{1,t}\frac{(\Delta REV_{j,t} - \Delta AR_{j,t})}{Asset_{j,t-1}} + k_{2,t}\frac{PPE_{j,t}}{Asset_{j,t-1}} + \varepsilon_{j,t}, \qquad (1)$$

where TA is total accruals in year t, Asset is firm j's total assets in year t, $\Delta REV_{j,t}$ is firm j's change in revenues from year t-1 to year t, $\Delta AR_{j,t}$ is firm j's change in accounts receivable from year t-1 to year t, and $PPE_{j,t}$ denotes firm j's gross values of property, plant, and equipment in year t. Then, the parameters from equation (1) are used to estimate the normal level of accruals (NA), as follows:

$$NA_{j,t} = \hat{k}_{0,t}\frac{1}{Asset_{j,t-1}} + \hat{k}_{1,t}\frac{(\Delta REV_{j,t} - \Delta AR_{j,t})}{Asset_{j,t-1}} + \hat{k}_{2,t}\frac{PPE_{j,t}}{Asset_{j,t-1}} \qquad (2)$$

Lastly, abnormal accruals (Abnormal AM) for firm j in year t are the difference between the actual value of total accruals and normal accruals from equation (2):

$$AbnormalAM_{j,t} = \frac{TA_{j,t}}{Asset_{j,t-1}} - NA_{j,t}. \quad (3)$$

(2) Real earnings management

In addition to abnormal accruals, we estimate a firm's real earnings management (RM). Real earnings management refers to activities that deviate from daily operations to satisfy certain earnings goals. Following Roychowdhury (2006), we estimate normal cash flows from operations using the following model:

$$\frac{CFO_{j,t}}{Asset_{j,t-1}} = \alpha_0 + \alpha_1 \frac{1}{Asset_{j,t-1}} + \alpha_2 \frac{Sales_{j,t}}{Asset_{j,t-1}} + \alpha_3 \frac{\Delta Sales_{j,t}}{Asset_{j,t-1}} + \varepsilon, \quad (4)$$

where $CFO_{j,t}$ is cash flows from operations for firm j in year t, $Asset_{j,t-1}$ is prior-year total assets, and $\Delta Sales_{j,t}$ is the change in sales from year t-1 to t for firm j. The estimated value of normal cash flows from operations in equation (4) is then subtracted from the actual value of cash flows from operations to obtain abnormal cash flows (Abnormal CFO).

The firm may decide to lower production costs by producing more units. Then, the firm can hide fixed costs in inventory and lower the costs of goods sold, resulting in an increase in net income for the period. We estimate the cost of goods sold (COGS) and changes in inventory based on the following two regressions for each industry (2-digit SIC code) and for each year:

$$\frac{COGS_{j,t}}{Asset_{j,t-1}} = \alpha_0 + \alpha_1 \frac{1}{Asset_{j,t-1}} + \alpha_2 \frac{Sales_{j,t}}{Asset_{j,t-1}} + \varepsilon, \quad (5)$$

$$\frac{\Delta INV_{j,t}}{Asset_{j,t-1}} = \alpha_0 + \alpha 1 \frac{1}{Asset_{j,t-1}} + \alpha_2 \frac{\Delta Sales_{j,t}}{Asset_{j,t-1}} + \alpha_3 \frac{\Delta Sales_{j,t-1}}{Asset_{j,t-1}} + \varepsilon, \quad (6)$$

where COGS is the cost of goods sold in year t, ΔINV is the change in inventory from year t-1 to year t, ΔS_{t-1} is the change in sales from year t-2 to t-1, and A_{t-1} is the total assets of year t-1. Production costs (PROD) are the sum of the cost of goods sold (COGS) and changes in inventory (ΔINV). From equations (5) and (6), we estimate the expected level of production costs (PROD), as follows:

$$\frac{\Delta PROD_{j,t}}{Asset_{j,t-1}} = \alpha_0 + \alpha_1 \frac{1}{Asset_{j,t-1}} + \alpha_2 \frac{Sales_{j,t}}{Asset_{j,t-1}} + \alpha_3 \frac{\Delta Sales_{j,t}}{Asset_{j,t-1}} + \alpha_4 \frac{\Delta Sales_{j,t-1}}{Asset_{j,t-1}} + \varepsilon, \quad (7)$$

We subtract an estimated value from equation (7) from the actual production costs to compute the abnormal production costs (Abnormal PROD).

A firm may decide to cut discretionary expenses or postpone R&D expenditures. Discretionary expenses (DISEXP) include selling, general, and administrative expenses, R&D expenses, and advertising expenses (Roychowdhury, 2006). We estimate the normal level of discretionary expense from equation (8) and compute the abnormal discretionary expense (Abnormal DISEXP):

$$\frac{DISEXP_{j,t}}{Asset_{j,t-1}} = \alpha_0 + \alpha_1 \frac{1}{Asset_{j,t-1}} + \alpha_2 \frac{Sales_{j,t}}{Asset_{j,t-1}} + \varepsilon, \quad (8)$$

Firms may decide to engage in the management of several real activities. We consider an aggregate measure of real earnings management, which is the sum of abnormal cash flows, abnormal production costs, and abnormal discretionary expense. For easy interpretation, we multiply abnormal cash flows and abnormal discretionary expense by -1 such that higher values of our real earnings management indicate income-increasing earnings management.

Appendix B: Variable definitions

Variable	Definition
Dependent variables:	
Loan Spread	Loan rate minus base rate, where the base rate is the monthly average 6-month LIBOR taken directly from *DealScan* database
Collateral	1 if the loan is secured with collaterals; 0 otherwise
Covenant Intensity Index	The sum of six covenant indicators (collateral, dividend restriction, more than two financial covenants, asset sales sweep, equity issuance sweep, and debt issuance sweep) available in *DealScan* database (see Chakravarty and Rutherford, 2011)
Loan characteristics variables:	
Reputation (-)	1 if at least one lead arranger was a top tier bank in the previous 3 years; 0 otherwise
Reputation	1 if a lead lender(s) is from the top five lenders, measured based on market share in the syndicated loan market in *DealScan* dataset; 0 otherwise
Maturity	The log of loan maturity in months
Collateral (+/-)	1 if the loan is secured by collateral; 0 otherwise
Secured Dummy	1 if the loan is secured; 0 otherwise
Loan Size	Loan amount at the facility-level divided by total assets
Loan Size (-)	The log of the loan amount
Deal Size (-)	Loan amount at the deal-level divided by total assets
Total Lender	Number of total lenders in the loan syndicate
Syndication Dummy	1 if loan is syndicated; 0 otherwise
Previous Lending	1 if over the previous three years the same lead bank arranged other loans for the same firm; 0 otherwise
Performance Pricing	1 if the loan has performance pricing; 0 otherwise
Term Loan	1 if the loan type is term loan; 0 for other types of loans
Revolver Loan	1 if the loan type is revolver loan; 0 for other types of loans
364 Facilities	1 if the loan type is 364 facilities; 0 for other types of loans
Corporate Control	1 if the loan purpose is to gain corporate control through acquisitions, merger, LBO, or takeover; 0 otherwise
Corporate Purpose	1 if the loan purpose is corporate purpose; 0 otherwise
Debt Repay	1 if the loan purpose is debt repayment; 0 otherwise
Project Finance	1 if the loan purpose is project finance; 0 otherwise
Earnings Attributes	
CF Vol.	Standard deviation of 3 years' cash flow from operations, scaled by assets
Earnings Vol.	Standard deviation of 3 years' earnings before extraordinary items, scaled by assets
Negative CF	1 if negative cash flows during previous 3 years; 0 otherwise
ACEV	Accrual component of earnings volatility, measured based on the difference between Earnings Vol. and CF Vol. (Jayaraman, 2008)
Abnormal CFO	Abnormal cash flow from operations (Roychowdhury, 2006)
Abnormal PROD	Abnormal production costs (Roychowdhury, 2006)
Abnormal DISEXP	Abnormal discretionary expenses (Roychowdhury, 2006)
RM1	An aggregate measure of real earnings management that is the sum of Abnormal PROD and Abnormal DISEXP
RM2	An aggregate measure of real earnings management that is the sum of Abnormal CFO and Abnormal DISEXP

AM	The absolute value of discretionary accruals based on the Modified Jones model
Firm characteristics variables:	
Firm Size	The log of total assets
ROA	Return on assets
Leverage	Long-term debt divided by total assets
Market-to-Book	Borrower's market-to-book ratio of assets
Tangibility	Property, plant, and equipment, scaled by total assets
Coverage	Earnings before interest and taxes divided by interest expense
Z-Score	3.3*(EBIT/AT) +0.99*(SALE/AT) +0.6*(FE/TL) +1.2*(ACT/AT) +1.4*(RE/AT)
Firm Age	Number of years a firm appeared in Compustat
AAA	1 if S&P senior debt rating is AAA; 0 otherwise
AA	1 if S&P senior debt rating is AA+, AA, or AA-; 0 otherwise
A	1 if S&P senior debt rating is A+, A, or A-; 0 otherwise
BBB	1 if S&P senior debt rating is BB+, BBB, or BBB-; 0 otherwise
BB	1 if S&P senior debt rating is BB+, BB, or BB-; 0 otherwise
B	1 if S&P senior debt rating is B+, B, or B-; 0 otherwise